

## **REMARKS / ARGUMENTS**

### **I Summary of the Amendments**

The present patent application now comprises fifty (50) claims, numbered 1 to 30, 35, 38 to 41, 50 to 55 and 59 to 67.

Claims 1, 6, 7, 9, 11, 12, 15 to 20, 23, 30, 35, 50 and 52 to 55 have been amended to clarify the subject matter being claimed. Claims 56 to 58 have been cancelled without prejudice. Claims 31 to 34, 36, 37 and 42 to 49 have been previously cancelled. New claims 59 to 67 have been added.

Support for amendments made can be found throughout the specification and drawings as originally filed, including, *inter alia*, p. 11, line 18 to p. 12, line 30 of the specification. No new matter has been added to the present patent application by way of the present amendment.

### **II Rejection of Claims 1 to 7, 22 to 25, 30, 50, 51 and 56 under 35 USC 103**

On page 2 of the Office Action, the Examiner rejected claims 1 to 7, 22 to 25, 30, 50, 51 and 56 under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,577,634 to Tsukakoshi *et al.* (hereinafter referred to as “Tsukakoshi”) in view of U.S. Patent No. 6,370,653 to Ichinohe *et al.* (hereinafter referred to as “Ichinohe”).

As described below, the Applicants respectfully submit that claims 1 to 7, 22 to 25, 30, 50 and 51, as effected by the present amendment, are in condition for allowance. The rejection of claim 56 is moot in view of cancellation of this claim from the application.

Independent claim 1

The Examiner's attention is directed to the following excerpt of amended claim 1, certain features of which have been emphasized:

A router supporting multiple routing protocols, said router comprising:

[...]

- c. a routing layer in communication with said interface layer, said routing layer including a plurality of routing protocol computing entities, **each routing protocol computing entity** being associated with a set of at least one routing protocol and **including**:

- i. a CPU; and
- ii. a **data storage medium** in communication with said CPU and storing program data for execution by said CPU to cause said routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the at least one routing protocol in the set associated with said routing protocol computing entity, said management of one or more peering sessions comprising maintaining in said data storage medium one or more route databases including routing data;

wherein **the set of at least one routing protocol associated with a first one of said routing protocol computing entities is different from the set of at least one routing protocol associated with a second one of said routing protocol computing entities**;

said router being operative for:

- **merging** the routing data included in the one or more route databases maintained in the data storage medium of each of said routing protocol computing entities to produce **merged routing data**; and
- **transferring** at least a portion of the **merged routing data** to the data storage medium of each of at least one of said routing protocol computing entities.

The Applicants respectfully submit that Tsukakoshi and Ichinohe, whether taken separately or in combination, do not teach or suggest the above-emphasized features of claim 1.

1<sup>st</sup> Feature: A plurality of routing protocol computing entities each associated with a set of at least one routing protocol and each including a CPU and a data storage medium, where the set of at least one routing protocol associated with a first routing protocol computing entity is different from the set of at least one routing protocol associated with a second routing protocol computing entity.

As conceded by the Examiner on page 6 of the Office Action, Tsukakoshi neither teaches nor suggests this feature of claim 1.

In order to address this deficiency of Tsukakoshi, the Examiner contends that Ichinohe discloses a router with several routing protocol process units each running a different routing protocol and that it would have been obvious to one of ordinary skill in the art to modify Tsukakoshi's clustered router to use routing protocol computing entities each running a different protocol.

With respect, the Examiner's contention is incorrect and serves as an incorrect basis for combining Tsukakoshi and Ichinohe.

Specifically, Ichinohe describes a router having a management module 101, a route calculating module 201, and repeating process modules 301, 401. The route calculation module 201 has "routing protocol process units" 203, 204 that calculate routes based on routing information transmitted by other routers. The management module 101 has corresponding "routing protocol process units" 113, 114 that can be invoked when a fault occurs in the route calculation module 201 (col. 3, lines 23 to 35; col. 3, line 52 to col. 4, line 6; col. 4, lines 30 to 39; and Fig. 1).

Each of Ichinohe's routing protocol process units is not a *hardware* component that includes a CPU and a data storage medium. Rather, each of these routing protocol process units is a *software* process to be executed. This can be seen from the following facts:

- A program for running all the routing protocol process units 203, 204 of the route calculating module 201 is stored in a storage medium (col. 4, lines 40 to 42). Similarly, a program for running all the routing protocol process units 113, 114 of the management module 101 is stored in a storage medium (col. 4, lines 7 to 12).
- When the management module 101 provides a substitute function upon occurrence of a fault in the route calculation module 201, the management module 101 may omit executing a particular one of its routing protocol process units in order to reduce a processing load of the management module 101 (col. 6, lines 52 to 65 and col. 8, line 5 to

- 9). If the particular one of the routing protocol process units was a hardware component including its own CPU, omitting performing its function would not reduce the processing load of the management module 101.
- Ichinohe describes monitoring “the CPU use rate” (singular form) of the management module 101, even though the management module 101 has several routing protocol process units 113, 114 to be executed (col. 12, line 9 to col. 13, line 19).
  - Each routing protocol process unit 203, 204, 113, 114 is clearly something to be executed (and thus not a hardware component) as clearly evidenced by Ichinohe’s constant reference to “execution of [a] routing protocol process unit” (emphasis added; Figs. 2, 5, 7, 9, 11, 13 and 15).

It is thus ample clear that each of Ichinohe’s routing protocol process units is a *software* process to be executed and not a *hardware* component that includes a CPU and a data storage medium.

Accordingly, Ichinohe, like Tsukakoshi, in no way teaches or suggests a first feature of claim 1, namely a plurality of routing protocol computing entities each associated with a set of at least one routing protocol and each including a CPU and a data storage medium, where the set of at least one routing protocol associated with a first routing protocol computing entity is different from the set of at least one routing protocol associated with a second routing protocol computing entity.

- 2<sup>nd</sup> Feature: The router being operative for:
- merging the routing data included in the one or more route databases maintained in the data storage medium of each of the routing protocol computing entities to produce merged routing data; and
  - transferring at least a portion of the merged routing data to the data storage medium of each of at least one of the routing protocol computing entities.

Firstly, Tsukakoshi describes a clustered router 11 in which each of a plurality of routers 12 has a route calculation unit 20. Each route calculation unit 20 includes a processor 41 that implements “two or more routing protocol means 15 which execute routing protocols”. Each route calculation unit 20 also includes a memory 42 storing network information 16 for each

routing protocol means 15 of that route calculation unit. From the network information 16, each route calculation unit 20 generates routing information and adds this information to a routing table 17 stored in its memory 42 (col. 3, lines 18 to 27 and col. 4, lines 44 to 52).

Tsukakoshi's clustered router 11 does not merge the routing information stored in the memory 42 of each of the route calculation units 20 to produce merged routing information. This is not surprising since Tsukakoshi's clustered router 11 is designed to ensure that all of the route calculation units 20 have the same routing information in their memory 42. Indeed, upon occurrence of a change in the network information 16 managed by a given routing protocol means 15 in a given router 12, this change is communicated to the corresponding routing protocol means 15 in all other routers 12 in the clustered router 11 such that all corresponding routing protocol means 15 in all the routers 12 have the same network information 16, from which is generated the routing information (see col. 2, lines 11 to 28; col. 3, lines 31 to 57; and col. 8, line 51 to col. 9, line 14 with col. 9, lines 43 to 50). This is further clearly evidenced by Tsukakoshi's own recap of, and main claim for, its clustered router 11, which describe that all routers 12 (and thus all route calculation units 20) in its clustered router 11 share their network information with each other so as to have identical network information (see col. 11, lines 6 to 10 and 46 to 49). There would thus be no point for Tsukakoshi's clustered router 11 to merge the routing information stored in the memory 42 of each of the route calculation units 20 since this information is the same across all the route calculation units 20.

Since Tsukakoshi does not effect any merging to produce merged routing information, Tsukakoshi cannot possibly teach or suggest transferring at least a portion of such merged routing information, which does not even exist, to the memory 42 of each of the route calculation units 20.

Secondly, Ichinohe describes that route information obtained by the routing protocol process units 203, 204 of the route calculating module 201 is stored in a routing table 202, and that route information obtained by the routing protocol process units 113, 114 of the management module 101 is stored in a routing table 112. As shown above, each of these routing protocol

process units 203, 204, 113, 114 is a *software* process and not a *hardware* component that includes a CPU and a data storage medium. It thus follows that Ichinohe's router cannot possibly merge route information that would be stored in a data storage medium of each of the routing protocol process units 203, 204, 113, 114 to produce merged route information, since such a data storage medium does not even exist.

Since Ichinohe does not effect any merging to produce merged route information, Ichinohe cannot possibly teach or suggest transferring at least a portion of such merged route information, which does not even exist, to a data storage medium of each of the routing protocol process units 203, 204, 113, 114, which data storage medium also does not even exist.

Accordingly, neither Tsukakoshi nor Ichinohe teaches or suggests a second feature of claim 1, namely that the router is operative for:

- merging the routing data included in the one or more route databases maintained in the data storage medium of each of the routing protocol computing entities to produce merged routing data; and
- transferring at least a portion of the merged routing data to the data storage medium of each of at least one of the routing protocol computing entities.

In light of the above, it is respectfully submitted that at least two features of claim 1, as amended, are neither taught nor suggested by Tsukakoshi and Ichinohe, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j)<sup>1</sup> is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claim 1, which is believed to be in condition for allowance.

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<sup>1</sup> For the Examiner to establish a *prima facie* case of obviousness, three criteria must be considered: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art references must teach or suggest all of the claim limitations. MPEP §§ 706.02(j), 2142 (8th ed.).

Dependent claims 2 to 7, 22, 50 and 51

Each of claims 2 to 7, 22, 50 and 51 depends on claim 1 and therefore incorporates by reference all the features of claim 1. Hence, for the same reasons as those set forth above in respect of claim 1, the Applicants respectfully submit that claims 2 to 7, 22, 50 and 51 are in condition for allowance. The Examiner is therefore respectfully requested to withdraw the rejections of these claims.

Independent claim 23

The Examiner's attention is directed to the following excerpt of amended claim 23, certain features of which have been emphasized:

A router, comprising:

[...]

- c. a routing layer in communication with said interface layer, said routing layer including a plurality of routing protocol computing entities, **each routing protocol computing entity** being associated with a routing protocol and **including:**
  - i. a CPU; and
  - ii. a **data storage medium** in communication with said CPU and storing program data for execution by said CPU to cause said routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the routing protocol associated with said routing protocol computing entity, said management of one or more peering sessions comprising maintaining in said data storage medium one or more route databases;  
wherein **the routing protocol associated with a first one of said routing protocol computing entities is the same as the routing protocol associated with a second one of said routing protocol computing entities; wherein the one or more route databases maintained in the data storage medium of said first one of said routing protocol computing entities contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of said second one of said routing protocol computing entities.**

The Applicants respectfully submit that Tsukakoshi and Ichinohe, whether taken separately or in combination, do not teach or suggest the above-emphasized features of claim 23.

Specifically, neither Tsukakoshi nor Ichinohe teaches or suggests a plurality of routing protocol computing entities each associated with a routing protocol and each including a CPU and a data storage medium, where:

- i. the routing protocol associated with a first routing protocol computing entity is the same as the routing protocol associated with a second routing protocol computing entity; and
- ii. the one or more route databases maintained in the data storage medium of the first routing protocol computing entity contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of the second routing protocol computing entity.

To begin with, in the Office Action, the Examiner rejected claim 23 without addressing part “ii.” of the above features (which was present in claim 23 prior to the present amendment). As such, the Examiner’s rejection of claim 23 is improper and the Examiner is respectfully requested to properly address each feature of that claim if he maintains his rejection.

Notwithstanding the impropriety of the Examiner’s rejection, the following comments are provided in the interest of advancing prosecution.

Regarding Tsukakoshi, as shown above in respect of claim 1, Tsukakoshi’s clustered router 11 is designed to ensure that all of the route calculation units 20 have the same routing information in their memory 42. In other words, there is *duplication* of network information 16 across all the route calculation units 20. This entails that the routing information stored in the memory 42 in all of Tsukakoshi’s route calculation units 20 contain information on identical sets of routes<sup>2</sup>. Therefore, Tsukakoshi cannot be held to teach or suggest the claimed

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<sup>2</sup> As shown above in respect of claim 1, Tsukakoshi’s routing tables 17 are built by route calculation units 20 that run identical sets of routing protocols on identical sets of network information 16. Based on this and Tsukakoshi’s total lack of any mention or suggestion that the resulting routing tables 17 are different, there is absolutely no reason to believe that the routing tables 17 are different from one another. On the contrary, this suggests that the routing tables 17 are indeed identical. In fact, Tsukakoshi’s stated purpose is to have its clustered router 11 appear to external routers as if it were a single router, and since Tsukakoshi’s routing table 17 is the route table that the forwarding units 18 receive copies of and it is standard in the art that all of the



scenario where the one or more route databases maintained in the data storage medium of a first routing protocol computing entity contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of a second routing protocol computing entity.

Regarding Ichinohe, as shown above in respect of claim 1, each of Ichinohe's routing protocol process units 203, 204, 113, 114 is a *software* process and not a *hardware* component that includes a CPU and a data storage medium. It thus follows that Ichinohe cannot possibly teach or suggest a data storage medium of a first routing protocol process unit containing information on at least one route for which there is no information in a data storage medium of a second routing protocol process unit, since such data storage media do not even exist.

In light of the above, it is respectfully submitted that at least one feature of claim 23, as amended, is neither taught nor suggested by Tsukakoshi and Ichinohe, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claim 23, which is believed to be in condition for allowance.

#### Dependent claims 24, 25 and 30

Each of claims 24, 25 and 30 depends on claim 23 and therefore incorporates by reference all the features of claim 23. Hence, for the same reasons as those set forth above in respect of claim 23, the Applicants respectfully submit that claims 24, 25 and 30 are in condition for allowance. The Examiner is therefore respectfully requested to withdraw the rejections of these claims.

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forwarding units of a given router receive copies of the same route table from which to make forwarding decisions about packets (as shown in each of Tsukakoshi's routers 12 in Figure 1), it is respectfully submitted that one of ordinary skill in the art looking at Tsukakoshi would conclude that the routing tables 17 are identical between any two routers 12 in Tsukakoshi.

### III Rejection of Claims 8 to 21, 52 to 55, 57 and 58 under 35 USC 103

On page 10 of the Office Action, the Examiner rejected claims 8 to 21, 52 to 55, 57 and 58 under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,577,634 to Tsukakoshi *et al.* (hereinafter referred to as “Tsukakoshi”) in view of U.S. Patent No. 6,370,653 to Ichinohe *et al.* (hereinafter referred to as “Ichinohe”) and further in view of U.S. Patent No. 7,003,582 to Basso *et al.* (hereinafter referred to as “Basso”).

As described below, the Applicants respectfully submit that claims 8 to 21 and 52 to 55, as effected by the present amendment, are in condition for allowance. The rejections of 57 and 58 are moot in view of cancellation of these claims from the application.

#### Dependent claims 8 to 21, 52 and 53

Each of claims 8 to 21, 52 and 53 depends on claim 1 and therefore incorporates by reference all the features of claim 1. These include the at least two features of claim 1 already shown in respect of that claim to be neither taught nor suggested by Tsukakoshi and Ichinohe, whether taken separately or in combination, namely:

- i) a plurality of routing protocol computing entities each associated with a set of at least one routing protocol and each including a CPU and a data storage medium, where the set of at least one routing protocol associated with a first routing protocol computing entity is different from the set of at least one routing protocol associated with a second routing protocol computing entity; and
- ii) the router being operative for:
  - merging the routing data included in the one or more route databases maintained in the data storage medium of each of the routing protocol computing entities to produce merged routing data; and
  - transferring at least a portion of the merged routing data to the data storage medium of each of at least one of the routing protocol computing entities.

It is respectfully submitted that Basso does not teach or suggest these two features of claim 1.

With respect to feature “i)”, Basso describes a system having a plurality of control point (CP) processors 25 connected to a network processor (NP) device 12 via a switch fabric 15. Each CP processor 25 “may comprise a general purpose processor” that runs “protocols/software applications” *A* (col. 1, line 64 to col. 2, line 27). There is, however, no explicit mention in Basso that the set of protocols/software applications *A* running on one CP processor 25 is different from the set of protocols/software applications *A* running on another CP processor 25.

With respect to feature “ii)”, and notwithstanding the above comments regarding feature “i)”, each of Basso’s CP processors 25 has a storage device in which it maintains routing information. Based on this routing information, each CP processor 25 causes addition, deletion or modification of entries in a forwarding table 18 of the NP device 12. Basso’s system (1) does not merge the routing information stored in the storage device of each CP processor 25 to produce merged routing information; and (2) does not transfer at least a portion of such merged routing information, which does not even exist, to the storage device of each CP processor 25.

Accordingly, Basso fails to teach or suggest at least one of the above features of claim 1 that have already been shown to be missing from Tsukakoshi and Ichinohe.

In light of the above, it is respectfully submitted that at least one feature of claims 8 to 21, 52 and 53 (via their dependency on claim 1) is neither taught nor suggested by Tsukakoshi, Ichinohe and Basso, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claims 8 to 21, 52 and 53, which are believed to be in condition for allowance.

Dependent claims 54 and 55

Each of claims 54 and 55 depends on claim 23 and therefore incorporates by reference all the features of claim 23. These include the features of claim 23 already shown in respect of that claim to be neither taught nor suggested by Tsukakoshi and Ichinohe, whether taken separately or in combination, namely a plurality of routing protocol computing entities each associated with a routing protocol and each including a CPU and a data storage medium, where:

- i. the routing protocol associated with a first routing protocol computing entity is the same as the routing protocol associated with a second routing protocol computing entity; and
- ii. the one or more route databases maintained in the data storage medium of the first routing protocol computing entity contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of the second routing protocol computing entity.

Firstly, as mentioned above in respect of claim 23, in the Office Action, the Examiner rejected claim 23 without addressing part “ii.” of the above features (which was present in claim 23 prior to the present amendment). As such, the Examiner’s rejection of claim 23, and thus of dependent claims 54 and 55, is improper and the Examiner is respectfully requested to properly address each feature of claim 23 if he maintains his rejection.

Notwithstanding the impropriety of the Examiner’s rejection, the following comments are provided in the interest of advancing prosecution.

Specifically, it is respectfully submitted that Basso does not teach or suggest the above features of claim 23 that have already been shown to be missing from Tsukakoshi and Ichinohe.

More specifically, each protocol/software application *A* running in each of Basso’s CP processors 25 maintains in that CP processor’s storage device a “protocol specific routing table 28” including routing information specific to that protocol (col. 3, lines 22 to 26). The

fact that each routing table 28 is “protocol specific” suggests that the routing table 28 maintained in the storage device of a first CP processor 25 running a given protocol/software application *A* includes the same routing information as the routing table 28 maintained in the storage device of a second CP processor 25 running that same given protocol/software application *A*. Unsurprisingly, therefore, there is no mention or suggestion in Basso that the protocol specific routing table 28 maintained in the storage device of a first CP processor 25 running a given protocol/software application *A* includes information on at least one route for which there is no information in the protocol specific routing table 28 maintained in the storage device of a second CP processor 25 running that same given protocol/software application *A*.

In light of the above, it is respectfully submitted that at least one feature of claims 54 and 55 (via their dependency on claim 23) is neither taught nor suggested by Tsukakoshi, Ichinohe and Basso, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claims 54 and 55, which are believed to be in condition for allowance.

#### **IV Rejection of Claims 26 to 29 under 35 USC 103**

On page 20 of the Office Action, the Examiner rejected claims 26 to 29 under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,577,634 to Tsukakoshi *et al.* (hereinafter referred to as “Tsukakoshi”) in view of U.S. Patent No. 6,370,653 to Ichinohe *et al.* (hereinafter referred to as “Ichinohe”) and further in view of U.S. Patent Application Publication No. 2003/0014665 to Anderson *et al.* (hereinafter referred to as “Anderson”).

As described below, the Applicants respectfully submit that claims 26 to 29, as effected by the present amendment, are in condition for allowance.

Dependent claims 26 to 29

Each of claims 26 to 29 depends on claim 23 and therefore incorporates by reference all the features of claim 23. These include the features of claim 23 already shown in respect of that claim to be neither taught nor suggested by Tsukakoshi and Ichinohe, whether taken separately or in combination, namely a plurality of routing protocol computing entities each associated with a routing protocol and each including a CPU and a data storage medium, where:

- i. the routing protocol associated with a first routing protocol computing entity is the same as the routing protocol associated with a second routing protocol computing entity; and
- ii. the one or more route databases maintained in the data storage medium of the first routing protocol computing entity contain information on at least one route for which there is no information in the one or more route databases maintained in the data storage medium of the second routing protocol computing entity.

Firstly, as mentioned above in respect of claim 23, in the Office Action, the Examiner rejected claim 23 without addressing part “ii.” of the above features (which was present in claim 23 prior to the present amendment). As such, the Examiner’s rejection of claim 23, and thus of dependent claims 26 to 29, is improper and the Examiner is respectfully requested to properly address each feature of claim 23 if he maintains his rejection.

Notwithstanding the impropriety of the Examiner’s rejection, the following comments are provided in the interest of advancing prosecution.

Specifically, it is respectfully submitted that Anderson does not teach or suggest the above features of claim 23 that have already been shown to be missing from Tsukakoshi and Ichinohe.

More specifically, Anderson describes a router 302 enabling automated and secure response to a distributed denial of service attack. The router 302 includes a processor 334 that handles various protocols implemented by the router 302 (parag. 39, lines 1 to 4; parag. 41, lines 1 to 7; and Fig. 4). Anderson thus in no way teaches or suggests a plurality of routing protocol computing entities each associated with a routing protocol and each including a CPU and a data storage medium. It follows that Anderson cannot possibly teach or suggest a data storage medium of a first routing protocol computing entity containing information on at least one route for which there is no information in a data storage medium of a second routing protocol computing entity, since such routing protocol computing entities and data storage media do not even exist.

In light of the above, it is respectfully submitted that at least one feature of claims 26 to 29 (via their dependency on claim 23) is neither taught nor suggested by Tsukakoshi, Ichinohe and Anderson, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claims 26 to 29, which are believed to be in condition for allowance.

## **V      Rejection of Claim 35 under 35 USC 103**

On page 23 of the Office Action, the Examiner rejected claim 35 under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,577,634 to Tsukakoshi *et al.* (hereinafter referred to as “Tsukakoshi”) in view of U.S. Patent Application Publication No. 2003/0014665 to Anderson *et al.* (hereinafter referred to as “Anderson”).

As described below, the Applicants respectfully submit that claim 35, as effected by the present amendment, is in condition for allowance.

Independent claim 35

Amended claim 35 is reproduced below with certain features being emphasized:

A router, comprising:

- a. **an interface layer including a plurality of I/O controllers**, each I/O controller implementing an I/O port;
- b. a switching layer in communication with said interface layer for selectively establishing signal pathways between said I/O ports;
- c. a routing layer in communication with said interface layer, said routing layer comprising a routing protocol computing entity capable of managing at least one peering session with a remote routing device, the peering session including the exchange of messages with the remote routing device through one of the I/O controllers, the peering session being comprised of a plurality of tasks;
- d. **the one I/O controller implementing a peering session assist module**,
- e. **said peering session assist module being capable of performing some of the tasks of the peering session autonomously from said routing protocol computing entity** of said routing layer;
- f. said routing layer being capable of performing tasks of the peering session other than the tasks performed by the peering session assist module;

wherein the tasks performed by the peering session assist module autonomously from said routing protocol computing entity include **authenticating, without intervention of said routing protocol computing entity, messages received from the remote routing device.**

The Applicants respectfully submit that Tsukakoshi and Anderson, whether taken separately or in combination, do not teach or suggest the above-emphasized features of claim 35.

Specifically, it is respectfully submitted that Tsukakoshi and Anderson, whether taken separately or in combination, do not teach or suggest an I/O controller of an interface layer of a router that is capable of authenticating, without intervention of a routing protocol computing entity of a routing layer of the router, messages received from a remote routing device during a peering session between the router and the remote routing device.

As conceded by the Examiner on page 25 of the Office Action, Tsukakoshi does not teach or suggest the above feature of claim 35.



To address this deficiency of Tsukakoshi, the Examiner contends that “Anderson discloses how the Border Gateway Protocol security features allow a router [*sic*] such that the tasks performed by the peering session assist module include authenticating messages received from the remote routing device”. The Examiner further contends that “[i]t would have been obvious [...] to modify Tsukakoshi’s clustered router to use the Secure Border Gateway Protocol with the advanced security features as the routing protocol to facilitate authenticating messages received from the remote routing device, the motivation being to minimize security vulnerabilities”.

With respect, the Examiner’s contention is incorrect and serves as an incorrect basis for combining Tsukakoshi and Anderson.

Firstly, the Examiner has not cited any passage of Anderson to support his contention regarding what Anderson allegedly discloses. Moreover, the Examiner’s statement regarding what Anderson allegedly discloses is unclear. If the Examiner maintains his rejection, he is respectfully urged to clarify his statement regarding what Anderson allegedly discloses and to cite one or more specific passages of Anderson to support his contention.

Secondly, notwithstanding the lack of clarity and support for the Examiner’s contention regarding what Anderson allegedly discloses, Anderson in no way teaches or suggests the above feature of claim 35. Specifically, Anderson describes a router 302 enabling automated and secure response to a distributed denial of service attack. The router 302 includes a forwarding plane 310 that performs “data-path packet processing, [...] packet redirection, packet filtering and packet manipulation”. The router 302 also includes a control plane 330 having a processor 334 that implements various routing protocols (parag. 37; parag. 38, lines 1 to 6; parag. 39, lines 1 to 4; parag. 40, lines 1 to 8; parag. 41, lines 1 to 7; and Fig. 4).

The forwarding plane 310 does not have any component that authenticates, without intervention of the control plane 330, messages received from a remote routing device during a peering session between the router 302 and the remote routing device. In fact, Anderson

describes that, when the router 302 receives a routing protocol update, it is the control plane 330 that authenticates the received routing protocol update (parag. 68, lines 1 to 10).

Accordingly, Anderson (like Tsukakoshi) fails to teach or suggest an I/O controller of an interface layer of a router that is capable of authenticating, **without intervention of a routing protocol computing entity of a routing layer of the router**, messages received from a remote routing device during a peering session between the router and the remote routing device.

In light of the above, it is respectfully submitted that at least one feature of claim 35 is neither taught nor suggested by Tsukakoshi and Anderson, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claim 35, which is believed to be in condition for allowance.

## **VI Rejection of Claims 38 and 41 under 35 USC 103**

On page 26 of the Office Action, the Examiner rejected claims 38 and 41 under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,577,634 to Tsukakoshi *et al.* (hereinafter referred to as “Tsukakoshi”) in view of U.S. Patent No. 6,049,524 to Fukushima *et al.* (hereinafter referred to as “Fukushima”) and U.S. Patent 7,003,582 to Basso *et al.* (hereinafter referred to as “Basso”).

As described below, the Applicants respectfully traverse this rejection and respectfully submit that claims 38 and 41 are in condition for allowance.

### **Independent claim 38**

Claim 38 is reproduced below with certain features being emphasized:

A router, comprising:

- a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port;
- b. a switching layer in communication with said interface layer for selectively establishing signal pathways between said I/O ports;
- c. a routing layer in communication with said interface layer;
- d. each I/O controller implementing an LSA entity, said LSA entity including an LS database, said LSA entity being responsive to an LSA message from a remote routing device including LS information to:
  - i. update said LS database; and
  - ii. forward the LS information to said routing layer.

It is respectfully submitted that Tsukakoshi, Fukushima and Basso, whether taken separately or in combination, do not teach or suggest an I/O controller of an interface layer of a router that implements an LSA entity, where the LSA entity includes an LS database and is responsive to an LSA message from a remote routing device including LS information to:

- update the LS database; and
- forward the LS information to a routing layer of the router.

Regarding Tsukakoshi, as conceded by the Examiner on page 26 of the Office Action, this reference “fails to expressly disclose that a routing protocol implemented in a route calculating entity can be a Link State protocol.” It is therefore not surprising that Tsukakoshi contains absolutely no mention or suggestion of a forwarding unit that implements an LSA entity including an LS database and having the updating and forwarding functionality claimed in claim 38.

Regarding Fukushima, this reference also fails to teach or suggest the above-mentioned elements of claim 38 that are missing from Tsukakoshi. Specifically, while Fukushima indeed describes an LS database 22, this LS database 22 is clearly maintained in Fukushima’s route calculation unit 11, i.e., in Fukushima’s routing layer. Therefore, it is abundantly clear that the LS database 22 is not maintained in Fukushima’s forwarding process units 13, i.e., in Fukushima’s interface layer (col. 5, lines 60 to 67; col. 6, lines 1 to 4; and Fig. 2).

The Examiner's contends, in point 51 starting on page 32 of the Office Action, that the routing table 19 in each of Fukushima's forwarding process units 13 can be viewed as a link state (LS) database. The Examiner's contention is incorrect for at least the following two reasons.

Firstly, a link state database is an industry standard term that is distinct from a routing table, which is another industry standard term. This is evidenced by Fukushima itself that clearly differentiates between its link state database 22 and its routing table 19 (col. 5, line 67 to col. 6, line 3; col. 6, lines 7 to 11; and Fig. 2).

Secondly, the content of a link state database is completely different from the content of a routing table. Specifically, a routing table does not contain information on the *state of links*, it contains information on *routes*. While a change in the state of a link can cause routes to be added or removed, the routing table only contains information on the resulting routes, not information on the state of the link that caused the change. Link states are not routes, and routes are not link states. This difference in content between a link state database and a routing table is clearly evidenced by Fukushima itself, which shows in Figs. 4 and 5 and describes that the content of its link state database 22 is completely different from the content of its routing table 19 (col. 4, lines 55 to 58 and col. 6, lines 27 to 60).

The Examiner's contention that the routing table 19 in each of Fukushima's forwarding process units 13 can be viewed as a link state (LS) database is therefore incorrect.

Accordingly, Fukushima neither teaches nor suggests a forwarding unit that implements an LSA entity including an LS database and having the updating and forwarding functionality claimed in claim 38.

Regarding Basso, this reference also fails to teach or suggest the above-mentioned features of claim 38 that are missing from Tsukakoshi and Fukushima. Specifically, each NP processor 12 of Basso's system supports a number of interface ports 20 and maintains a forwarding table 18 (col. 2, lines 8 to 11 and 36 to 42). Basso in no way teaches or suggests a forwarding

unit that implements an LSA entity including an LS database and having the updating and forwarding functionality claimed in claim 38.

In light of the above, it is respectfully submitted that at least one feature of claim 38 is neither taught nor suggested by Tsukakoshi, Fukushima and Basso, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claim 38, which is believed to be in condition for allowance.

#### Dependent claim 41

Claim 41 depends on claim 38 and therefore incorporates by reference all the features of claim 38. Hence, for the same reasons as those set forth above in respect of claim 38, the Applicants respectfully submit that claim 41 is in condition for allowance. The Examiner is therefore respectfully requested to withdraw the rejection of this claim.

### **VII Rejection of Claims 39 and 40 under 35 USC 103**

On page 30 of the Office Action, the Examiner rejected claims 39 and 40 under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,577,634 to Tsukakoshi *et al.* (hereinafter referred to as “Tsukakoshi”) in view of U.S. Patent No. 6,049,524 to Fukushima *et al.* (hereinafter referred to as “Fukushima”) and U.S. Patent 7,003,582 to Basso *et al.* (hereinafter referred to as “Basso”), and in further view of U.S. Patent No. 6,820,134 to Zinin *et al.* (hereinafter referred to as “Zinin”).

As described below, the Applicants respectfully traverse this rejection and respectfully submit that claims 39 and 40 are in condition for allowance.

Dependent claims 39 and 40

Each of claims 39 and 40 depends on claim 38 and therefore incorporates by reference all the features of claim 38.

As already shown in respect of claim 38, Tsukakoshi, Fukushima and Basso, whether taken separately or in combination, do not teach or suggest an I/O controller of an interface layer of a router that implements an LSA entity, where the LSA entity includes an LS database and is responsive to an LSA message from a remote routing device including LS information to:

- update the LS database; and
- forward the LS information to a routing layer of the router.

Furthermore, Zinin also fails to teach or suggest these features of claim 38 (and thus of claims 39 and 40) that are missing from Tsukakoshi, Fukushima and Basso. Specifically, while Zinin describes a link state database 220, this link state database 220 is clearly not maintained in any of Zinin's network interfaces 210A to 210D, i.e., in Zinin's interface layer (col. 6, lines 31 to 34 and Fig. 2).

In light of the above, it is respectfully submitted that at least one feature of each of claims 39 and 40 (by virtue of their dependency on claim 38) is neither taught nor suggested by the cited references, whether taken separately or in combination. Therefore, the Applicants respectfully submit that at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j) is not satisfied. The Examiner is thus respectfully requested to withdraw the rejection of claims 39 and 40, which are believed to be in condition for allowance.

**VIII Remarks regarding New Claims 65 to 67**

New claim 65 is reproduced below with certain features being emphasized:

A router supporting multiple routing protocols, said router comprising:

- a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port;
- b. a switching layer in communication with said interface layer for selectively establishing signal pathways between said I/O ports; and
- c. a routing layer in communication with said interface layer, said routing layer including a plurality of routing protocol computing entities, each routing protocol computing entity being associated with a set of at least one routing protocol and including:
  - i. a CPU; and
  - ii. a data storage medium in communication with said CPU and storing program data for execution by said CPU to cause said routing protocol computing entity to effect management of one or more peering sessions with remote routing devices according to the at least one routing protocol in the set associated with said routing protocol computing entity, said management of one or more peering sessions comprising maintaining in said data storage medium one or more route databases including routing data;

wherein the set of at least one routing protocol associated with a first one of said routing protocol computing entities is different from the set of at least one routing protocol associated with a second one of said routing protocol computing entities;

said router being operative for:

- **merging** the routing data included in the one or more route databases maintained in the data storage medium of each of said routing protocol computing entities to produce **merged routing data** that includes data regarding destinations and routes for the destinations, including, for each of at least one of the destinations, a plurality of routes for that destination; and
- **pruning** the **merged routing data** by retaining, for each destination, **at most a set number of routes** for that destination.

The Examiner will appreciate that new claim 65 is similar in some respects to claim 1. The Applicants respectfully submit that none of the references cited against claim 1 and its dependent claims (i.e., Tsukakoshi, Ichinohe and Basso) teaches or suggests the claimed features of the router being operative for:

- merging the routing data included in the one or more route databases maintained in the data storage medium of each of said routing protocol computing entities to produce merged routing data that includes data regarding destinations and routes for the destinations, including, for each of at least one of the destinations, a plurality of routes for that destination; and
- pruning the merged routing data by retaining, for each destination, at most a set number of routes for that destination.

Accordingly, new claim 65 is believed to be in condition for allowance. Also, new claims 66 and 67 depend on new claim 65 and are thus also believed to be in condition for allowance.

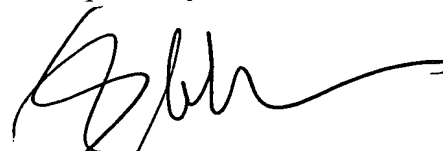


### CONCLUSION

The Applicants are of the view that claims 1 to 30, 35, 38 to 41, 50 to 55 and 59 to 67 are in condition for allowance. Favorable reconsideration is requested. Early allowance of the present patent application is earnestly solicited.

If the present patent application is not considered to be in full condition for allowance, for any reason, the Applicants respectfully request the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims pursuant to MPEP 707.07(j) or in making constructive suggestions pursuant to MPEP 706.03 so that the application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Respectfully submitted,

  
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